

# ATOMIC ENERGY *newsletter.*

THE FIRST AND ONLY ATOMIC NEWS SERVICE

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Dear Sir:

The second largest lump sum contract to be awarded by the U. S. Atomic Energy Commission since its inception may go to Utah Construction Co., Salt Lake City. The firm was the apparent low bidder on this contract, which was for first phase construction of ground testing facilities for a prototype aircraft nuclear reactor at the National Reactor Testing Station, Arco, Idaho. Utah's bid was \$4,585,028; it was the lowest of nine submitted, the second apparent lowest bidder being Robert E. McKee, El Paso, Texas, with \$4,707,300. The second portion of this work, which will be for an initial engine test area, will involve approximately \$5 million. A competitive bid contract will be awarded this Spring for the job. Among other proposed work at the Reactor Testing Station will be a decontamination facility, hazardous materials storage facility, and compressed bottle gas storage building at the chemical processing plant, where contaminated nuclear reactor elements will be handled. (Other BUSINESS news: page 2, this LETTER.)

In connection with studies being made for the USAEC by the porcelain and pottery section of the National Bureau of Standards on the possible use of ceramics, as structural and fuel elements for nuclear reactors, a "Bibliography of Selected References on the Solid-State Reactions of the Uranium Oxides" has been put together by the Bureau. It may be obtained from the Superintendent of Documents, Wash. 25, D.C., at 30 cents per copy. (Other NEW PUBLICATIONS: page 4 this LETTER.)

Elaborate plans have now been formulated by the Special Weapons Project of the Armed Forces for the forthcoming tests March 17th of "new and improved" nuclear explosives at the Las Vegas, Nevada, proving ground. Among objectives of the Special Weapons Project will be to determine the effects of radiation on military equipment and field fortifications. Additionally, the largest number of troops which has yet participated in nuclear weapon maneuvers will receive training in self-protection and in assault tactics relating to atomic warfare; they will maneuver under simulated atomic combat conditions.....Meanwhile, the Army is attempting to secure specially qualified volunteers from regular and reserve officer ranks for assignment in research and development, military applications, etc., in the field of atomic energy. Educational requirements are degrees in chemistry, physics, or mathematics. When accepted, they will then be given special training in civilian or military educational facilities.

A realistic shelter program for highly congested areas, and a practical, step-by-step dispersal program for industry are basic requirements for effective civil defense against atomic bombs, the Federal Civil Defense Administration said in its annual report, which was released last fortnight in Washington. The FCDA pointed out that the United States' civil defense is "not developing fast enough to meet the threat that now faces us". The agency assumed 400 enemy bombers could strike, with no more than 15-minutes warning, among the sixty-seven areas it designated as most likely targets.

BUSINESS NEWS...in the nuclear energy field...

INDUSTRY AND ATOMIC ENERGY- The results of work with atomic energy, and by-products of this work, are currently being used in various ways by private industry although widespread application is still some years away, an analysis by the Council for Technological Advancement, Chicago, has disclosed. In discussing future applications of atomic work, the Council points out that it takes little imagination to see that the future is bright with promise. The question, it says, is one of industry's participation in the development and use of atomic energy. Now, under present conditions, only a few companies share in and contribute to advances made in this area. For maximum benefits, the Council advocates a program which will encourage in atomic energy the "kind of competitive effort which has made the automobile and chemical industries what they are today in the United States".

The Council separates the interest of private industry into two areas of potential technological advancement: (1) production of economic electric power from the heat of nuclear reactions, and (2) industrial applications of radioisotopes. Concerning radioactive tracers, the Council explains that research into the fundamentals of materials, using radioactive tracers, is not new, since many scientifically minded companies have employed this method in the past. It is because the atomic piles have made such compounds, available in larger quantities, and at lower cost, that radioactive tracers are being used more widely today. In dollar value, their use is small at the present time, the Council notes. The applications are already varied, and will be of increasing importance to industry, it is the Council's opinion. As is the case with any method in industry, radioactive tracers are employed because they do a job that could not be done before, do a better job, or perform a job more economically, the Council states. It also notes that while the use of this technique has resulted in significant cost saving and product improvements, industry does not make as much use of this technique as it might due to a lack of information as to the usefulness and uses of isotopes.

The Council points out that although in an early stage of development, radioactive materials are finding increased application as industrial controls. Their use, it says, in the automatic control of chemical, metallurgical, and other processes presages one of the important developments to come out of atomic energy work, with instruments now commercially available to measure such properties as liquid levels, thickness of material, or the density of products.

INSURANCE PROBLEMS OF NUCLEAR PARTICLE ACCELERATORS STUDIED Recommendations for the safe installation of particle accelerators--cyclotrons, betatrons, cosmotrons etc.-- have now been drawn up by Factory Insurance Associates, Hartford, Conn., at the request of the National Board of Fire Underwriters. Their report, made public last fortnight, shows that in the U.S. some serious fire damage has already occurred due to faulty installations. Among recommendations, to prevent further damage, is that accelerators be located neither underground nor on the upper stories of buildings. Water, rather than oil, is recommended as a coolant, and non-inflammable material for walls, floors, shields and conduits is urged. Special warning was made against the use of paraffin in shields, and bituminous coatings for metal partition, or other structural parts. Eight-inch reinforced concrete was recommended for partitions, including the use of parapets, or else 3/4 -inch gypsum plaster on metal lath. It was also suggested that such installations not be made in earthquake country, or in flood or tornado territory. Other recommendations were similar to underwriters codes for high-voltage electricity, high temperature processes, and the use of coolants.

CONTRACTS LET & BIDS ASKED AT ATOMIC INSTALLATIONS-Low bidder on a contract for construction of a hot cell and hot cell building at the National Reactor Testing Station, Arco, Idaho, was Arrington Construction Co., Idaho Falls, at \$153,380. The hot cell and hot cell building will be constructed in the Materials Testing Reactor area; the cell will permit visual examination, modification, adjustment, and repair of experimental equipment after irradiation in the nuclear reactor.....Invitation number 401-53-5A has now been issued by the USAEC at Oak Ridge for the ground installations part of the tower shielding facility to be erected there. Inquiries should be sent to the USAEC, Oak Ridge Construction Area, Oak Ridge, Tenn.

AT SCIENTIFIC MEETINGS...papers on nuclear energy subjects...

UNITED STATES- AMERICAN CHEMICAL SOCIETY:- The 123rd national meeting, to be held in Los Angeles March 15-19, will hear a paper on The Determination of Radiogold in Biological Tissues, by L. C. Weiss, A. W. Steers, and H. M. Bollinger; this will be in the Analytical Chemistry Division. This division will also hear a paper by D. G. Miller and M. B. Leboeuf on the Evaluation of Alpha Counting Instruments by the Pulse Distribution Method, and Analysis of Radionuclide Mixtures Using a Gamma-Beta Scintillation Spectrometer, by R. E. Connally and M. B. Leboeuf.....In the Symposium on Instrumentation, R. C. McMaster will discuss Non-Destructive Methods of Testing.....The Symposium on Air Pollution will hear E. C. Evans, R. K. Skow, H. M. Steiner, and J. Wittman discuss Radon and Radon Decay Product Concentrations in Large Air Volumes; L. B. Werner, W. E. Shelberg, and L. H. Gevantman discuss Problems of Radiological Contamination Arising from Atomic Bomb Debris; and J. F. Pestaner and L. Gevantman discuss Device for Generating a Radioactive Solid Aerosol .....In the Symposium on Industrial Requirements for Process Water, A. E. Gorman will discuss Some Environmental Aspects in the Disposal of Radioactive Wastes.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS:- The Biloxi (Miss.) national meeting, March 8-11, will hear a paper by D. H. Northrup (Cambridge Corp.) on the AEC or CWS Air Filter. This filter, developed within the past ten years for the USAEC, is a high efficiency filter used to remove radioactive particles from the air. About two years ago it was declassified and made available for general use. Since then, installations have been made in industrial plants which have areas or processes requiring a high degree of air cleaning. Installations have also been made in exhaust systems where highly toxic and poisonous particles must be removed. This paper presents a description of the filter, as well as its design, construction, performance, specifications, and features. The paper also considers in some detail the different process applications in which the filter has been used. Actual installations are discussed in regard to design, installation, and maintenance of typical filter systems. The economics of this filter operation is also considered in rather complete detail.....The meeting will also hear a paper by R. M. Cohen and G. H. Beyer, Institute for Atomic Research, Iowa State College, Ames, Iowa, on Performance of a Pulse Extraction Column. The paper describes a continuous countercurrent liquid-liquid extraction column containing perforated plates which was operated with a pulsed liquid phase.

GREAT BRITAIN-SOCIETY OF CHEMICAL INDUSTRY, Chemical Engineering Group:- A paper presented in 1952, by C. M. Nicholls and A. S. White (Atomic Energy Research Establishment, Harwell, Eng.) covered pilot plant problems of the chemical engineer in the development of processes handling radioactive materials. The authors point out that there are four factors that tend to distinguish the types of chemical processes encountered in this radio-chemical work and that these factors have a profound effect on the design of plants for carrying out the processes: (1) factors unique to radioactive materials; (2) toxicity of the chemicals handled; (3) value of the products; (4) lack of information and experience. Because of the radioactive transformations which these substances undergo, the chemical natures of the elements present are constantly changing, and these changes are accompanied by the emission of alpha or beta particles or gamma rays. Thus it is necessary to be conscious of the age of the material and, since the particles or radiations emitted can have serious physiological effects, plant operators have to be protected against them by means of shielding. The thickness of this shielding required in any particular section of a plant is affected by several factors: (1) The energy of the radiation, (2) The nature of the shielding material, (3) The amount of activity at the source for each radiation energy, (4) The geometry of the source and shield, (5) The minimum working distance from the source, (6) The nature of the source. It has been found possible in Great Britain, by strict attention to the following seven safety points, to operate plants handling radioactive materials without ill-effect to a single scientist or industrial worker: (1) Provision of adequate protection clothing and monitoring instruments, (2) The careful selection and training of supervisory staff, (3) The preparation of adequate, clear, and concise regulations, (4) Strict discipline in all matters relating to contamination control, (5) Precise delegation of operating authority, (6) Radiation safety-mindedness and attention to relevant details in design stages, (7) Thorough testing and proving of plant with inactive materials wherever possible before radioactive materials are used.



RAW MATERIALS...radioactive minerals for nuclear work...

UNITED STATES: Permits to allow exploration for uranium ores in the Capitol Reef National Monument have now been issued by the USAEC's Grand Junction, Colo., office. Small amounts of uranium have been found in this area over the past twenty years, and it is considered a favorable area for additional prospecting.....The large minerals exploration program conducted by the Geological Survey for the USAEC is reflected by the work which the GS did during 1952 for the USAEC (and is now doing): figures now released show that almost one-half of the GS's minerals deposits staff is directly engaged in work for the USAEC, the Defense Minerals Exploration Administration, and other defense agencies.

CANADA: One of the most recent uranium mineral finds in addition to columbium-tantalum, is that of Inspiration Mining and Development Co. Drilling through the ice at Lake Nipissing, the company has struck what has assayed out as 0.092% uranium oxide, for a core length of 20-feet.....Uranium values are reported by Rix-Athabaska Uranium Mines at its property in the Beaverlodge district of Northern Saskatchewan. Assays have been made of two drift rounds which represent an advance of approximately 20-feet; one round assayed 0.19% uranium oxide across 8.1-feet, while the other round gave 0.7% uranium oxide across 6.6-feet.....Two new properties in this same Athabaska area, both adjoining Rix-Athabaska, have been acquired by Lodge Uranium Mines. They were a part of that company's former concession, and ownership has been contested in the courts, with outright ownership only recently granted to Lodge. Officials of that firm state that there is a promising looking pitchblende showing on this group, which has returned good values in preliminary work.....The first diamond drilling has now started at the St. Mary's Channel district property of Iso Uranium Mines. The property adjoins to the east and south the main Gunnar Gold Mines property. Following completion of this initial work, it is proposed to probe along the projected line of strike of the main Gunnar occurrence. Limited surface work in this area last Fall turned up radioactive showings.....The 12-claim Rip group adjoining two groups of Goldfields Uranium, about 4½-miles from Uranium townsite, at Lake Athabaska, has now been acquired by Norpax Oils & Mines. The Goldfields claims separate Norpax' property from Rix Athabasca's new ground now under development.....

BULGARIA: It is reported that promising uranium ore deposits discovered near Sofia are being worked to a considerable extent. Concentrates are being sent to the Soviet Union.

INDIA: A new mineral, very rich in thorium and uranium, has been discovered in the State of Travancore in South India. The mineral, which contains 31% thorium oxide, and 4% uranium oxide, has been named cheralite, from Chera, the ancient name of the State of Travancore. The deposit of the mineral is too small to be of any commercial importance.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Pile Neutron Research, by Donald J. Hughes, Brookhaven National Laboratory. A treatment of the techniques employed in pile research, which should be useful to those using nuclear reactors in such research. Should be of use also as a text for any basic course in science or engineering involving chain-reacting systems. 384-pages. --Addison-Wesley Publishing Co., Inc., Cambridge 42, Mass. (\$7.50)

Annual Review of Nuclear Science, Vol. 2. Covers origin and distribution of the elements, energy production in stars, natural radiocarbon, accelerator progress, nuclear reactions induced by high energy particles, photonuclear reactions, sub-nuclear particles, radiation effects in solids, isotopes, nuclear moments, theory of beta-decay, origin of cosmic rays, and high energy fission. 429 pages. --Annual Reviews, Inc., Stanford, Calif. (\$6.00)

Dosimetry of Ionizing Radiations by Means of Color Centers in Sensitized Alkaline-Earth Salts. Work done at U. S. Naval Research Laboratory on X-ray induced discoloration of alkali-halide crystals. (PB-11074; 50¢).....Strontium-90 As a Replacement for Radium in Deck and Personnel Markers. Represents a 1½-year study by the NRL in using the radioisotope in night military operations. (PB-111068; 50¢).... Above two publications available from Office of Technical Services, Wash. 25, D.C.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Newly designed sample spinner, to facilitate and expedite the preparation of samples from slurries or low particulate dispersions in solution. The slow rotation of this sample spinner is said to simplify uniform sample spreading by such methods as mechanical spraying and drying the carrier when a "settling out" method has been used. For speed in drying, the manufacturer recommends the use of an infra-red lamp in conjunction with this spinner. Turntable speed is 20 rpm. --Radiation Counter Laboratories, Inc., Skokie (Chicago) Ill.

Direct reading dosimeters (quartz fiber models), developed to meet military requirements, and now available generally; said to equal or surpass current commercial specifications. Metal mounting barrels are  $\frac{1}{2}$ -inch in diameter, and  $4\frac{1}{2}$ -inches long, except the 200 mr model which is 4-inches long. Six models available in the ranges, respectively, of 200 mr, 5 r, 10 r, 20 r, 50 r, and 100 r.....Combined neutron and gamma ray dosimeter; a new development in low range dosimeters. Gives a combined reading for slow and thermal neutrons, and for X-and gamma rays. The full scale reading for X- and gamma rays is 200 mr; for slow and thermal neutrons the full scale reading represents the same potential damage to the body, namely 200 mr equivalent physical. It is, therefore, not necessary to wear a separate gamma or neutron sensitive meter.....New roentgen meters, of this manufacturer's midget type, are said to have such advantages as: sealed against dirt and moisture; able to stand rough handling without failure; light in weight and of convenient size. They are also said to have only slight energy dependence for which a correction curve is provided, and can be exposed directly in hard X-ray and gamma-ray beams without shielding the insulation.--Landsverk Electrometer Co.

ATOMIC PATENT DIGEST...latest U. S. patent grants...

Comparative photometer. Comprises, in part, the combination of a stationary support holding a film and negatives in fixed relative positions, with a movable carriage mounted adjacent this support and movable transversely to it, light scanning means for directing pencils of light onto the negatives, with associated light receivers, and a light projector, connected to these light receivers, projecting light upon the film in dependence upon the amount of light falling upon the light receivers. U. S. Pat. No. 2,626,989 issued January 27th, 1953; assigned to United States of America (USAEC).

Apparatus for measuring current-voltage characteristics. Comprises, in part, an amplifier having an input and an output, with a first and second vacuum tube, so that a device, having characteristics which it is desired to determine, may be connected between the control grid of this second vacuum tube and a neutral voltage, whereby a voltage proportional to the current through this device appears at the output of the amplifier each time a linearly varying voltage is applied to the control grid of the first tube. U. S. Pat. No. 2,628,268 issued February 10th, 1953; assigned to United States of America (USAEC).

Portable voltage supply for radiation counters. A power supply comprising, in part, means to generate a D.C. voltage, including a spring powered generator, capacitive storage means connected to the generator, and an electrically operated switch which connects the generator only when it is operating. U. S. Pat. No. 2,628,338 issued February 10, 1953; assigned to United States of America (USAEC).

Apparatus for fractional sublimation. Comprises, in part, a tube wound in the form of a helix and rotatable about the axis of this helix, means for introducing a mixture (whose components are to be separated) into the tube, means for establishing (respectively) zones of low temperature to condense, and zones of high temperature to vaporize, the mixture, these condensing and vaporizing means being spaced circumferentially about said helix and extending longitudinally thereof, and means for rotating the tube. U. S. Pat. No. 2,628,892 issued February 17, 1953; assigned to United States of America (USAEC).

Sincerely,

The Staff,  
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